Table A-6: Questions and Answers

GENERAL QUESTIONS

Has the listing order of the chemicals in Table A-6 changed somewhat?

Yes. Starting with the 2013 edition, the chemicals in Table A-6 appear alphabetically. The 2012 version lumped some chemicals under overarching categories, like polyaromatic hydrocarbons (PAHs). We hope the new arrangement is more convenient.

Many chemicals have more than one name, which can make it difficult to find them in the table, or even to know whether they are in the table. Help?

One possibility is to search the table for the chemical's Chemical Abstract Service (CAS) number. Another is to do an internet search for synonyms of the chemical's name. IDEM may, at its discretion on some future date, post a cross-reference of some of the more common chemical synonyms on its website.

What do the alphabetical codes next to most of the screening levels mean?

One of six alphabetical codes accompanies most levels in the table. These codes provide information on what "drives" the screening level:

C Screening level based on a carcinogenic effect
L Soil direct contact screening level capped at 100,000 mg/kg
M Screening level set to maximum contaminant limit (MCL; ground water direct contact), or based on MCL (migration to ground water screening level)
N Screening level based on noncarcinogenic effect
R Screening level capped at 1,000,000 mg/kg, based on physical reality
S Screening level capped at soil saturation limit

Page 188 of the Remediation Closure Guide also contains a key to the codes.

The laboratory detected a chemical that is not in the table. Now what?

It is not surprising that unlisted chemicals show up during analysis. U.S. EPA has identified more than 80,000 chemicals currently manufactured or processed in the United States, and IDEM's screening levels table contains less than 800 chemicals. Because adequate toxicological data simply do not exist and are not under development for most chemicals, that discrepancy is unlikely to change. Further, IDEM does not anticipate developing screening levels for chemicals that do not appear in U.S. EPA's Regional Screening Levels table. So – what to do?

If other chemicals are present at concentrations that warrant a remedy, ask whether the remedy is also likely to adequately address risk from the chemical(s) that lack screening levels. The answer to that question will depend in part on factors such as the characteristics of the chemical and its post-release distribution. For example, a remedy that controls risk arising from

benzo(a)pyrene (a chemical that appears in the screening levels table) is quite likely to control risk from other polyaromatic hydrocarbons (e.g., tetracene, or phenanthrene) that do not appear in the table. For chemicals of uncertain origin, it may be possible to show through a background investigation that the release did not meaningfully contribute to observed concentrations of the chemicals in question. Finally, chemicals for which there are no screening levels may still be subject to sources of regulatory authority such as solid waste rules or hazardous waste rules.

QUESTIONS ABOUT SPECIFIC CHEMICALS

The entries for some metals and their compounds are confusing and appear to overlap. For example, there is an entry for *zinc and compounds* and another entry for *zinc cyanide*. Since zinc cyanide is a zinc compound, can I use the *zinc and compounds* levels to evaluate risk from zinc cyanide?

*When the table lists levels for a specific compound, use the compound-specific levels to evaluate risk from that compound. In this case, reserve the "*zinc and compounds*" levels for use in evaluating risk from zinc and zinc compounds that do not have their own entries in the table.*

Cadmium has two entries in the table – cadmium (diet) and cadmium (water). When is it appropriate to use each entry?

Use the cadmium (diet) levels when evaluating soil direct contact risk, and use the cadmium (water) levels when evaluating ground water direct contact risk, the potential for migration to ground water, and indoor air risk.

There are many types of dioxins, but the table only includes levels for 2,3,7,8-TCDD. What is the procedure for evaluating risk arising from other types of dioxins and chlorinated furans?

U.S. EPA recommends applying toxicity equivalence factors (TEFs) that relate the toxicity of other dioxins and dioxin-like chemicals to the toxicity of 2,3,7,8-TCDD. Procedures for doing so appear in the U.S. EPA document Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds.

The entries for PCBs are confusing, and warrant further explanation.

There are 209 different types, or congeners, of polychlorinated biphenyls (PCBs). Congeners differ in the number and arrangement of chlorine atoms on the molecule. Laboratories may report concentrations of specific congeners, concentrations of commercial mixtures of congeners (usually known as Aroclors) or total PCB concentrations. Table A-6 includes entries for some of each of these general categories.

In general, use PCB screening levels in the following order of preference, depending on data availability: (1) individual congeners, (2) Aroclors, or (3) total PCBs. If only total PCB results are available, compare them to the "high risk" screening levels for the soil direct contact

exposure scenario, to the "low risk" screening levels for evaluation of the ground water exposure scenario, and to the "high risk" screening levels when evaluating indoor air exposure.

What does *stable strontium* mean? Is there an "unstable" strontium?

Stable strontium refers to naturally occurring, nonradioactive forms (isotopes) of strontium. Some strontium isotopes, like Strontium-90, are unstable and undergo radioactive decay. The screening levels in the table are not appropriate for evaluation of risk arising from radioactive (unstable) forms of strontium. IDEM will refer evaluation of risk from radioactive substances to the Indiana State Department of Health.

SOIL DIRECT CONTACT QUESTIONS

There are no soil direct contact levels for total chromium. When evaluating soils for potential soil direct contact exposure to chromium, should the laboratory speciate any chromium found in the samples?

IDEM recommends collecting valence-specific data wherever chromium – especially chromium VI – is likely to be an important contaminant at a site.

Why do the soil direct contact screening levels for lead have no alphabetical codes (e.g., "C", "N", etc.) accompanying them?

The alphabetical codes used for other chemicals do not apply to lead, because U.S. EPA has not identified reference doses for lead and instead relies on lead exposure and uptake models to generate lead screening levels.

Why are soil direct contact screening levels for some chemicals identical across two or more exposure scenarios?

This happens when caps apply to the soil direct contact levels in the table. There are two principal caps for this exposure scenario: soil saturation limit (C_{sat}) and a 100,000 mg/kg cap. Both caps account for limitations in the applicability of the equations used to calculate screening levels.

TAP AND MIGRATION TO GROUND WATER QUESTIONS

Why does the table have tap water and migration to ground water screening levels for insoluble chromium salts? If they are insoluble, how can they be in ground water, or migrate to ground water?

Sometimes insoluble chemicals bind to particles suspended in the ground water. This can result in exposure to end users, even for chemicals that do not go into solution.

Why do some chemicals have levels for ground water, but not migration to ground water?

This usually happens when the U.S. EPA table on which our levels are based lacks Henry's Law Constant data for the chemical.

VAPOR QUESTIONS

Why are there so few vapor intrusion ground water screening levels?

IDEM calculates vapor intrusion ground water screening levels using a method described in Sections A.5.1 and A.5.2 of the Remediation Closure Guide. That method requires a temperature-adjusted Henry's Law constant; the US EPA Fact Sheet, Correcting the Henry's Law Constant for Soil Temperature describes how to temperature-adjust the Henry's Law constant. The adjustment procedure requires chemical-specific data on enthalpy of vaporization, which is available for relatively few chemicals; hence the scarcity of vapor intrusion ground water screening levels in the IDEM table.

Why are so many indoor air screening levels "missing" in the table?

The table only includes indoor air screening levels for chemicals that are volatile. Many of the chemicals in the table are nonvolatile, and therefore have no indoor air screening levels. Also, some volatile chemicals lack the inhalation toxicity data necessary to calculate screening levels.